

Unit 4

Day 6

Section 1.3

Dividing Polynomials

- Long Division and Synthetic Division

MAKE FONT A LOT BIGGER!!!

quotient

divisor

dividend

$$\begin{array}{r} 56 \\ 15 \overline{)842} \\ \underline{75} \\ 92 \\ \underline{90} \\ 2 \end{array}$$

Therefore, $842 \div 15$ is $56 + \frac{2}{15}$

1)

Find the quotient when

$3x^3 + 4x^2 + x + 7$ is divided by $x^2 + 1$.

$$\begin{array}{r}
 3x + 4 \\
 \hline
 x^2 + 1 \overline{) 3x^3 + 4x^2 + x + 7} \\
 \underline{- 3x^3} \\
 4x^2 - 2x + 7 \\
 \underline{- 4x^2} \\
 -2x + 3
 \end{array}$$

$$\frac{3x^3}{x^2} = 3x$$

$$3x + 4 + \frac{-2x + 3}{x^2 + 1}$$

3)

(quotient)(divisor) + remainder = dividend

$$(3x+4)(x^2 + 1) + (-2x + 3)$$

check

4) Find the quotient when

$4x^5 - 3x^2 + x + 1$ is divided by $2x^3 - 1$.

$$\begin{array}{r} 2x^2 \\ 2x^3 - 1 \overline{) 4x^5 + 0x^4 + 0x^3 - 3x^2 + x + 1} \\ \underline{-4x^5} \\ + 2x^2 \\ \underline{-2x^2} \\ -x^2 + x + 1 \end{array}$$

$$2x^2 + \frac{-x^2 + x + 1}{2x^3 - 1}$$

1)

Use synthetic division to divide $x^3 - 4x^2 + 5$ by $x - 3$

must be 1

must be 1

$$\begin{array}{r|rrrr}
 3 & 1 & -4 & 0 & 5 \\
 & & 3 & -3 & -9 \\
 \hline
 & 1 & -1 & -3 & -4
 \end{array}$$

coeff of
quotient

remainder

$$x^2 - x - 3 + \frac{-4}{x-3}$$

2)

Use synthetic division to divide $3x^3 + 4x^2 + x + 7$ by $x + 1$

$$\begin{array}{r|rrrr} -1 & 3 & 4 & 1 & 7 \\ & & -3 & -1 & 0 \\ \hline & 3 & 1 & 0 & 7 \end{array}$$

$$3x^2 + x + \frac{7}{x+1}$$

4)

Use synthetic division to divide

$$x^3 - 4x^2 - 5 \text{ by } x - 3$$

$$\begin{array}{r|rrrr} 3 & 1 & -4 & 0 & -5 \\ & & 3 & -3 & -9 \\ \hline & 1 & -1 & -3 & -14 \end{array}$$

$$x^2 - x - 3 + \frac{-14}{x-3}$$

hmk:

Day 6 homework pg 35: 77-84 all
PLUS - pg. 290: 5-12 all